Comments on National Academy of Sciences Study and Future Fuel Economy Improvements, Model Years 2005-2010

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NHTSA has requested comments on the findings of the recent NAS study regarding CAFE standards and vehicles safety (Federal Register 67, 28 p 5767, Question 1). The NAS study majority found that "the historical CAFE program contributed to traffic fatalities and injuries."

We disagree strongly with this finding. In our report "Losing Weight to Save Lives: A Review of the Role of Automobile Weight and Size in Traffic Fatalities", which we presented to the NAS committee, we indicated that fatalities in cars per million cars sold have been decreasing over the last 15 years, while car fuel economy has increased or remained stable. These decreases in fatalities are because of improved car designs (partly in response to NHTSA crash testing), improved passenger restraints and their more widespread use, and improved roadway design. However, the number of fatalities in cars struck in the side by light trucks is increasing; others (Gabler and Hollowell, 1998; Hollowell and Gabler, 1996; Joksch, 1998; Joksch, 2000) have shown that this increase is due to incompatibility between cars and light trucks.

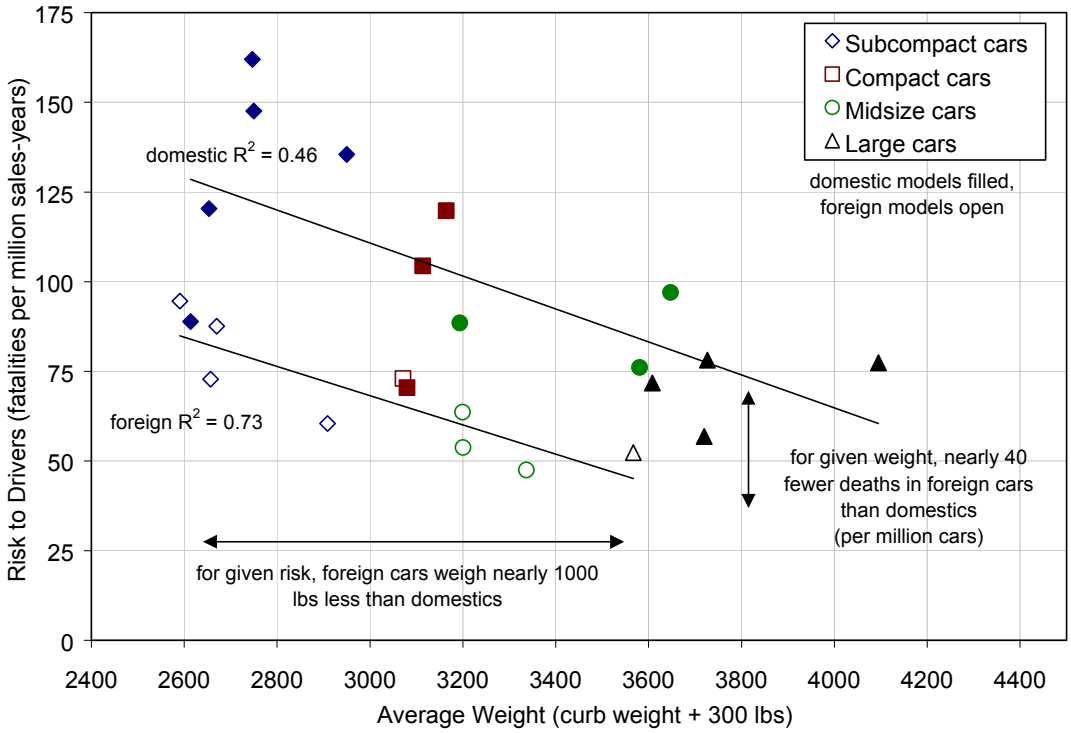
There are several flaws with the study (Kahane, 1997) on which the NAS panel appears to base their finding. First, the 1997 study used fatality data in vehicles from model years 1985 to 1993. Our analysis indicates that the safety of cars has been improved dramatically over the last 15 years. Indeed, a more recent study using the exact same methodology applied to vehicles from model years 1985 to 1998, found that a 100-pound reduction in light-duty vehicle weights would result in no significant increase in vehicle fatalities (Van Auken and Zellner, 2002). Second, the Kahane study used vehicle weight as the only variable to explain differences in vehicle design (other than vehicle type), because that variable was available. We provide below evidence that weight may not be the best variable to use as a proxy for how vehicle design affects its safety. And although the study included a number of driver characteristics and environmental variables, an important variable, use of seat belts, was not included because it was not available. Finally, the Kahane study assumed that the historical correlation of vehicle size and weight would continue. The study itself noted that this assumption is speculative, given

the advances in lightweight and durable materials and other technologies that can be used to reduce vehicle weight without reducing size.

We recently completed a study of driver fatality rates in popular one- to five-year old vehicles, by vehicle type and model ("An Analysis of Traffic Deaths by Vehicle Type and Model", available for download at http://www.aceee.org/pubs/T021full.pdf). We found that the risk to drivers of the average SUV is the same as the risk to drivers of the average midsize and large car. In addition, we found that the risk to drivers of individual subcompact car models can vary by a factor of two, with the safest subcompact (and compact) car models posing the same risk to their drivers as the average SUV.

The figure below shows the risk to drivers of the most popular car models, by car weight and class. The regression lines for domestic and foreign cars imply that the risk to drivers decreases with increasing car weight. However, because the trend lines are parallel, for a given weight there appears to be about 40 fewer deaths per million vehicles in foreign cars than in domestic cars, about a 40% reduction. Similarly, for a given level of risk, foreign cars appear to be 1,000 lbs lighter than domestic cars. These figures suggest that factors of design, other than size and weight, play an important, if not dominant, role in car safety.

Risk to Drivers by Average Weight, Car Class, and Manufacturer (24 Most Popular Car Models). Domestic models indicated by filled symbols, foreign models by open symbols. Trend lines are for domestic and foreign models. Weight is curb weight + 300 lbs.



Our study estimates the risk not only to drivers of particular vehicle types and models, but also the risk those vehicles impose on drivers of other vehicles, and the combined risk, which is the sum of the two. The incompatibility between SUVs and cars results in SUVs imposing nearly two times the risk to drivers of other vehicles than the risk imposed by cars. The combined risk of the average SUV, therefore, is nearly 30% higher than the combined risk of the average midsize or large car, and is comparable to that of the average compact or subcompact car. Pickup trucks have the highest combined risk of all major vehicle types we studied, while minivans have the lowest; we suspect these results are in part due to who drives pickups and minivans, as well as where and how. Pickups tend to be driven more by young males, and in rural areas where speeds are higher and roadway design and lighting levels tend to be less safe. And minivans are among the least likely vehicle types to be driven by young males; extra care may be taken in minivans because they often are used to transport children. (Our analysis indicates that accounting for driver age and sex would not alter our results regarding the relative risk of SUVs and cars in general.)

Our analyses suggest that the safety of cars has been increased dramatically in the last 15 years, despite any restrictions imposed by CAFE standards. Indeed, some manufacturers have demonstrated that smaller cars can be, and have been, designed to simultaneously improve fuel economy and safety. The biggest hindrance to a further decline in fatalities is the increasing number of SUVs and pickup trucks being used as car substitutes. Any changes to the CAFE standards should be designed to reduce the incompatibility between cars and light trucks, while preserving incentives for manufacturers to make fuel efficient and safe cars.

References

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